

Table 1. Snow pigeon flock sizes.

Location and habitat	Period	Abundance
Sa Wang; 32°24'N 93°39'E; forest, riverbank and farmland; 3,600–4,500 m	Late May to mid-June 1995	18–120
	Late June to early October 1995	1–6
	Mid-October 1995	20–100
Duo Ji; 29°50'N 95°33'E; forest; riverbank; 3,500 m	Mid-May 2001	50–150
Chang Mao Ling; 31°24'N 96°00'E; forest, riverbank; 4,100 m	Late May 2001	25, 32
Lhasa region; 29°40'N 91°40'E; scrub, meadow, riverbank; 3,600–4,000 m	Throughout year, 1995–2002	2–5

Table 2. Measurements of two Snow Pigeon nestlings.

Date	Chick	Mass (g)	Body length (mm)	Tail (mm)	Wing (mm)	Bill (mm)	Tarsus (mm)
9 May	A	33.8	88.8	-	15.1	4.8	12.0
	B	40.0	100.0	-	17.0	6.8	13.5
4 June	A	136.0	162.0	13.0	58.1	8.3	22.2
	B	140.1	172.0	21.2	65.0	9.3	24.6

Snow Pigeons live in flocks during the non-breeding season, from mid-October to mid-June (Table 1), and forage on riverbanks and in valley-bottom barley fields, roosting on precipitous cliffs. Cheng *et al.* (1983) reported that this species occurs at 2,900–3,900m, but I found them up to 4,500m. Grimmett *et al.* (1998) gives 3,000–5,200 m (occasionally to 5,700 m) as the altitude in summer for this species.

A nesting attempt was recorded in Xiong Se valley (29°27'N 91°40'E), 30 km from Lhasa city. The nest-site was located at 4,020 m on a low cliff, 2.5 m above the ground, next to a stream. On 6 May 2001, I discovered an almost-complete nest, and saw both parents collecting nest material 50 m from the nest-site. The

nest was simply constructed from thin roots lined with grass stems, and measured 23.5 cm in diameter, 13.0 cm in depth and 10.5 cm in height. I returned on 29 May and found two chicks, with yellow down and open eyes, being brooded. I measured and weighed them, and repeated this on 4 June (Table 2). On 5 June, the two chicks were found dead below the nest-site having fallen out during a storm the previous night.

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REFERENCES

Ali, S. and Ripley, S. D. (1987). *Handbook of the birds India and Pakistan*. Oxford: Oxford University Press.
 Cheng, T. H., Li, D. H., Wang, Z. X., Wang, Z. Y., Jiang, Z. H. and Lu, T. C. (1983) *The avifauna of Tibet*. Beijing: Science Press.
 Grimmett, R., Inskipp, C. and Inskipp, T. (1998) *The birds of the Indian subcontinent*. London: Christopher Helm.

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Delayed plumage maturation in Asian thrushes, genus *Turdus*

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Intermediate plumages between juvenile and full adult plumages, particularly in males, have been widely documented in birds (Lyon and Montgomerie 1986). Among thrushes of the genus *Turdus*, however, this documentation has been limited to species with predominantly black plumage (Escalona-Segura and Peterson 1997). This phenomenon, however, has clearly been under-appreciated in the genus, and is distributed more broadly than had previously been thought. During

a recent expedition to Heilongjiang province, in north-eastern China, we were able to assemble series of specimens that allowed us to demonstrate that delayed plumage maturation is also present in the Grey-backed Thrush *Turdus hortulorum*, which is of the olive-and-red *Turdus* plumage type.

In this series, females were uniformly olive on the back, whitish on the belly, and finely streaked on the throat and upper breast (KU 92151 and one

uncatalogued). Males, however, presented two distinct plumage types, particularly concerning the colouration of the throat: one closely resembling that of the female in the presence of grey streaking on the throat, and the other that had a solid light grey bib. The latter is usually cited as the definitive male plumage for this species (McKinnon and Phillipps 2000).

The presence of a female-like plumage in juvenile male Grey-backed Thrushes is interesting, but not particularly unexpected. However, one specimen (KU 92148) had enlarged gonads (testes 6 x 10 mm, white colour), and lacked a bursa completely. This specimen suggests that this plumage is not simply an immature stage. Indeed, inspection of series of specimens in the collections of the University of Washington Burke Museum, Russian Academy of Sciences in St Petersburg, and the Chinese Academy of Sciences in Beijing suggests that the frequency of this plumage type may be about 15%, and that it appears to represent a common subadult plumage retained even when males reach breeding condition.

The phenomenon of subadult male plumages in *Turdus* thrushes is likely to be quite widely distributed in the genus (Escalona-Segura and Peterson 1997). Inspection of extensive modern series of specimens from Russia in the collections of the University of Washington Burke Museum (UWBM) provided clear indications of the presence of such an intermediate plumage in at least five additional Asian *Turdus* species, although full evidence was not assessed. (1) *Turdus merula aterrimus*: males UWBM 49341 and 64714 are greyer than other males, with overall colouration closer to that of females. (2) *Turdus obscurus*: males UWBM 44020, 58395 and 59713 have cream-coloured throat with some streaking, less extensive and duller supercilium, and lighter and browner head and back, all more similar to females than to adult males. (3) *Turdus philomelos philomelos*: males UWBM 57425, 66753 and 67747 have more rusty colouration on the breast, slightly denser spotting on the breast, and very slightly redder back than adult males. (4) *Turdus ruficollis atrogularis*: males 56711, 56721 and 56753 have whitish scalloping on the greyer-black throat and breast, less black on the face and cheeks, and more uniform colouration of nape and back than in adult males. (5) *Turdus pilaris*: males UWBM 58375, 59499 and 59522 have blacker breast markings restricted to the upper breast, less rusty infusion on

breast, and greyer colouration of the head (except in UWBM 59522) than adult males. Consultation of relevant literature, including Cramp and Perrins (1977–1994), McKinnon and Phillipps (2000), and a sampling of Russian ornithological literature (thanks to literature searches by M. Wilson and V. Loskot) did not reveal any mention of such intermediate plumages.

The point of this very brief review is that a previous contribution (Escalona-Segura and Peterson 1997) underestimated the frequency of delayed plumage maturation in *Turdus* thrushes considerably in suggesting that the phenomenon may be restricted to the species with predominantly black plumage. Here, we present evidence for its occurrence in at least five additional *Turdus* species, including other plumage types. A clear next step will be an overall survey of the distribution of this phenomenon across this complex genus; however, such a review will require phylogenetic information for the genus, which may well prove to be polyphyletic, accounting for some of the complexity.

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REFERENCES

- Cramp, S. and Perrins, C. M., eds. (1977–1994) *The birds of the Western Palearctic*. Oxford: Oxford University Press.
- Escalona-Segura, G. and Peterson, A. T. (1997) Variable plumage ontogeny in the Black (*Turdus infuscatus*) and Glossy-black (*T. serranus*) robins. *Wilson Bull.* 109: 182–184.
- Lyon, B. E. and Montgomerie, R. (1986) Delayed plumage maturation in passerine birds: reliable signalling by subordinate males? *Evolution* 40: 605–615.
- MacKinnon, J. and Phillipps, K. (2000) *A field guide to the birds of China*. Oxford: Oxford University Press.

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